

What is claimed is:

1. A water-cooled vertical engine comprising:
  - a crankshaft disposed substantially vertically;
  - a connecting rod;
  - a piston connected via the connecting rod to the crankshaft;
  - a cylinder housing the piston in a reciprocating manner;
  - a cylinder block including the cylinder;
  - a cylinder head secured to the cylinder block;
  - a combustion chamber formed by the cylinder head in cooperation with the cylinder and the piston;
  - a head exhaust passage;
  - exhaust passage means for discharging exhaust gas from the combustion chamber to the outside;
  - a cylinder block cooling water jacket around the combustion chamber, the cylinder block cooling water jacket being formed in the cylinder block;
  - a cylinder head cooling water jacket around the combustion chamber, the cylinder head cooling water jacket being formed in the cylinder head and being substantially separate and independent from the cylinder block cooling water jacket;
  - an exhaust passage cooling water jacket formed around the exhaust passage means and substantially separate and independent from the cylinder head cooling water jacket; and
  - a cooling water pump for supplying cooling water to each of the water jackets;
- wherein the engine further comprises: a first cooling path for supplying cooling water from the cooling water pump to the cylinder block cooling water jacket via the exhaust passage cooling water jacket;
- a second cooling path for supplying cooling water from the cooling water pump to the cylinder head cooling water jacket; and

a thermostat in each of the cylinder block cooling water jacket and the cylinder head cooling water jacket.

2. The water-cooled vertical engine according to Claim 1, wherein a plurality of cylinders are arranged in parallel in a substantially vertical direction.

3. The water-cooled vertical engine according to Claim 1, wherein the cylinder head cooling water jacket has a cooling water inlet provided in mating surfaces of the cylinder head and the cylinder block, and cooling water from the cooling water pump connected to the cylinder block is supplied to the cylinder head cooling water jacket via the cooling water inlet.

4. The water-cooled vertical engine according to Claim 3, wherein the cooling water inlet is provided at the lowest part of the cylinder head cooling water jacket.

5. An outboard motor equipped with a water-cooled vertical engine comprising:  
a crankshaft disposed substantially vertically;  
a connecting rod;  
a piston connected via the connecting rod to the crankshaft;  
a cylinder housing the piston in a reciprocating manner;  
a cylinder block including the cylinder;  
a cylinder head secured to the cylinder block;  
a combustion chamber formed by the cylinder head in cooperation with the cylinder and the piston;  
a head exhaust passage;  
exhaust passage means for discharging exhaust gas from the combustion chamber to the outside;  
a cylinder block cooling water jacket around the combustion chamber, the cylinder block cooling water jacket being formed in the cylinder block;

a cylinder head cooling water jacket around the combustion chamber, the cylinder head cooling water jacket being formed in the cylinder head and being substantially separate and independent from the cylinder block cooling water jacket;

an exhaust passage cooling water jacket formed around the exhaust passage means and substantially separate and independent from the cylinder head cooling water jacket; and

a cooling water pump for supplying cooling water to each of the water jackets;

wherein the engine further comprises: a first cooling path for supplying cooling water from the cooling water pump to the cylinder block cooling water jacket via the exhaust passage cooling water jacket;

a second cooling path for supplying cooling water from the cooling water pump to the cylinder head cooling water jacket; and

a thermostat in each of the cylinder block cooling water jacket and the cylinder head cooling water jacket.

6. An outboard motor equipped with an engine comprising:

intake and exhaust valves;

a combustion chamber opened and closed by the intake and exhaust valves;

cooling means for cooling heat generated within the combustion chamber;

a cooling medium that is fed to the cooling means;

exhaust passage means for discharging exhaust gas from the combustion chamber to the outside; and

supply means employing the exhaust passage means as a heat source, heating part of the cooling medium using the heat source, and supplying to the cooling means the cooling medium having a temperature increased by the heating.

7. A water-cooled vertical engine comprising:

a crankshaft extending substantially vertically;

a plurality of combustion chambers disposed along the crankshaft;  
exhaust passage means for guiding exhaust gas from the combustion chambers to the outside;

an exhaust passage cooling water jacket provided in the exhaust passage means;

a cylinder block;

a cylinder block cooling water jacket provided in the cylinder block in order to cool the surroundings of the combustion chambers;

a cylinder head;

a cylinder head cooling water jacket provided in the cylinder head in order to cool the surroundings of the combustion chambers; and

a cooling water pump for supplying cooling water to each of the water jackets;

wherein the engine further comprises a cooling water temperature sensor for detecting overheating, the cooling water temperature sensor being provided in each of the exhaust passage cooling water jacket and the cylinder head cooling water jacket, the cylinder block cooling water jacket and the cylinder head cooling water jacket being substantially independent, and the cylinder block cooling water jacket being connected to the downstream side of the exhaust passage cooling water jacket.

8. An outboard motor equipped with a water-cooled vertical engine comprising:
  - a crankshaft extending substantially vertically;
  - a plurality of combustion chambers disposed along the crankshaft;
  - exhaust passage means for guiding exhaust gas from the combustion chambers to the outside;
  - an exhaust passage cooling water jacket provided in the exhaust passage means;
  - a cylinder block;

a cylinder block cooling water jacket provided in the cylinder block in order to cool the surroundings of the combustion chambers;

a cylinder head;

a cylinder head cooling water jacket provided in the cylinder head in order to cool the surroundings of the combustion chambers; and

a cooling water pump for supplying cooling water to each of the water jackets;

wherein the engine further comprises a cooling water temperature sensor for detecting overheating, the cooling water temperature sensor being provided in each of the exhaust passage cooling water jacket and the cylinder head cooling water jacket, the cylinder block cooling water jacket and the cylinder head cooling water jacket being substantially independent, and the cylinder block cooling water jacket being connected to the downstream side of the exhaust passage cooling water jacket.